

Notice of Allowability

Application No.

10/014,822

Examiner

Carol Chaney

Applicant(s)

BARKER ET AL.

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed 22 December 2003.
2. ☒ The allowed claim(s) is/are 181-329.
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 12-22-03
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Carol Chaney
Primary Examiner
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Allowable Subject Matter

Claims 181-329 are allowed.

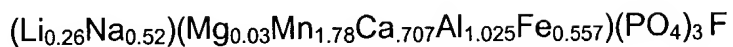
The following is an examiner's statement of reasons for allowance: Applicants' newly filed claims overcome the prior art of record for the following reasons:

Independent claims 181 and 201 recite electrode active materials and a battery which comprise the electroactive materials as recited. The electroactive materials require a combination of phosphate and silicate anions. The nearest prior art of Shackle and Rinaldi do not suggest a combination of phosphate and silicate anions in similar compounds, particularly in electroactive compounds.

Independent claims 224 and 240 recite an electrode active material and a battery which comprise the electroactive materials as recited. In these cases, the electroactive material may include both phosphates and silicates, as well as a combination of the two. However, the claims are limited to compounds which include two or more transition metals. The nearest prior art of Rinaldi discusses a structure refinement of griphite minerals using x-ray diffraction techniques. The structural formula for griphite is given as $(\text{Li}_{2.08}\text{Na}_{4.13}\text{Mg}_{0.24}\text{Ca}_{1.66}\text{Mn}_{14.24}\text{Fe}^{+2}_{1.29}\text{Fe}^{+3}_{0.05})\text{Ca}_4(\text{Fe}^{+2}_{0.7}\text{Al}_{0.13}\square_{0.7})_4(\text{Al}_{0.96}\text{Fe}^{+3}_{0.04})_8(\text{PO}_4)_{24}\text{F}_8$

If the formula is re-written by taking 1/8 of formula above, the formula can be given as

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In this case applicants' variable 'A' is $\text{Li}_{0.26}\text{Na}_{0.52}$ and variable 'M' is $\text{Mg}_{0.03}\text{Mn}_{1.78}\text{Ca}_{.707}\text{Al}_{1.025}\text{Fe}_{0.557}$. However, $0.03 + 1.78 + .707 + 1.025 + 0.557 \approx 4$, which fails to meet the claim limitation $1 \leq b \leq 3$.

Please note that in the previous office action In order to simplify comparison with applicants electrode active material formula, the examiner had relied on the generic empirical formula for griphite given at the website

<http://www.webmineral.com/data/Griphite.shtml> in an attempt to simplify comparison of the composition of the mineral griphite with applicants' electrode active material. The rejection was made over the Rinaldi reference, with the webmineral data provided as supporting evidence, so that the date of the website is immaterial to the rejection.

However, since 'A' in applicants' formulae are limited to Li, Na, K and mixtures thereof, \ A cannot include Mn, as was asserted in the previous office action.

With regards to independent claims 224 and 240, Shackle recites compounds of the formula $\text{M}_x\text{T}_y\text{A}_z$, but there is no suggestion that T, defined by Shackle as metal ion capable of existing in more than one stable oxidation state selected from Mn, Ni, Fe, V, Ti, Co, Cu, Cr, Sn, Pb, W, and Mo can comprise more than one metal.

With regards to independent claim 260, similar to the discussion above, the nearest prior art of Shackle does not suggest an alkali metal, transition metal, halo or hydroxy phosphate or silicate which includes both a transition metal and a metal

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selected from Groups 2, 3, 12, 13 or 14 of the periodic table. Shackle suggests incorporating only one metal in the formula of his inventive cathode materials.

With regards to independent claims 287 and 307, the limitation $a = 3 + 2x + d$ is not suggested by the prior art. This limitation excludes compounds which have only phosphate anions. The maximum value of 'a' is eight. When $x=3$, the recited compound will contain only phosphate anions. However, when $x=3$, $3 + 2x + d$ is $9 + d$, exceeding the allowed value for 'a'. Compounds which contain only silicate anions are encompassed by the formula, but the silicate compounds disclosed by Shackle, such as $\text{Li}_2\text{Mn}(\text{SiO}_4)$ --equivalently $\text{Li}_6\text{Mn}_3(\text{SiO}_4)_3$ —would require “doping” with 3 fluorine atoms for the limitation $a = 3 + 2x + d$ to hold. Such a large amount of lithium is not considered “doping”.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carol Chaney whose telephone number is (571) 272-1284. The examiner can normally be reached on Mon - Fri 8:30am-5:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Carol Chaney
Primary Examiner
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21 March 2004